

WHAT IS CLAIMED IS:

- 1 1. A device for collecting viable gas-borne matter comprising:
2 an inlet;
3 an outlet;
4 a plate provided intermediate the inlet and the outlet and having a first
5 surface facing the inlet and a second surface facing the outlet; and
6 a substance provided on the first surface of the plate for capturing
7 viable matter carried in a gas drawn through the inlet;
8 wherein the substance is configured to maintain the viable matter in a
9 living state without promoting growth of the viable matter.
- 1 2. The device of claim 1, wherein the substance is at least one of a gel
2 and a semi-solid material.
- 1 3. The device of claim 1, wherein the substance is relatively colorless.
- 1 4. The device of claim 1, wherein the substance comprises a hydrocolloid
2 and at least one nutrient.
- 1 5. The device of claim 4, wherein the hydrocolloid is selected from the
2 group consisting of algal type hydrocolloid materials, botanical type hydrocolloid
3 materials, microbial type hydrocolloid materials, animal type hydrocolloid materials,
4 and combinations thereof.
- 1 6. The device of claim 5, wherein the algal type hydrocolloid materials
2 comprise at least one of agar, carrageenan, and alginate.
- 1 7. The device of claim 5, wherein the botanical type hydrocolloid
2 materials comprise at least one of arabic, karaya, guar, locust tara, tamarind, daraya,
3 ghatti, tragacanth, cellulose, starch, pectin, knonjac, glactomannans, xyloglucan, and
4 combinations thereof.

1 8. The device of claim 5, wherein the microbial type hydrocolloid
2 materials comprise at least one of curdlan, xanthan, dextran, gellan, B-glucans,
3 chitosan, alginates, inulin, CRC biopolymer, and combinations thereof.

1 9. The device of claim 5, wherein the microbial type animal type
2 hydrocolloid materials comprise at least one of gelatin, caseinate, whey, and chitosan.

1 10. The device of claim 4, wherein the nutrient is one of a sugar, a cell
2 culture serum, an amino acid, a blood lipid, and a protein.

1 11. The device of claim 10, wherein the nutrient is selected from the group
2 consisting of glucose, sucrose, bovine serum, glutamic acid, albumin, hemoglobin,
3 charcoal, sodium glycerophosphate, mercaptoacetic acid, sodium chloride, potassium
4 citrate, potassium chloride, calcium chloride, magnesium chloride, monopotassium
5 phosphate, disodium phosphate, sodium thioglycollate, L-cysteine hydrochloric,
6 peptone, sodium phosphate, potassium phosphate, and combinations thereof.

1 12. The device of claim 10, wherein the nutrient also acts as a pH buffer.

1 13. The device of claim 4, wherein the substance further comprises at least
2 one of a humectant, water, and an anti-bacterial agent.

1 14. The device of claim 13, wherein the humectant is selected from the
2 group consisting of mineral oil, plant oil, peanut oil, soybean oil, vegetable oil, corn
3 oil, molasses, honey, corn syrup, fruitrim, invertase, invert sugar, glycerin, polyols,
4 Triacetin, an hydrogenated glucose syrup, a polydextrose nutrient, and combinations
5 thereof.

1 15. The device of claim 13, wherein the anti-bacterial agent is selected
2 from propylene glycol, chloramphenicol, vancomycin, and combinations thereof.

1 16. The device of claim 13, wherein the substance further comprises an
2 antifungal.

1 17. The device of claim 1, wherein the substance may be stored without
2 refrigeration between approximately 12 to 24 months.

1 18. The device of claim 1, wherein the substance is configured to allow
2 removal of the viable matter from the substance in a liquid.

1 19. The device of claim 18, wherein the liquid is water.

1 20. The device of claim 1, wherein the viable matter comprises at least one
2 of mold spores, insects, insect parts, and skin cells.

1 21. The device of claim 1, wherein the viable matter comprises a virus.

1 22. The device of claim 1, wherein the viable matter comprises bacteria.

1 23. The device of claim 1, wherein the inlet is configured for coupling to a
2 device configured to remove matter from the gas before the gas enters the inlet.

1 24. The device of claim 1, wherein the device is configured for coupling to
2 an exterior surface of a sampling device.

1 25. The device of claim 1, wherein the device comprises a top portion
2 including the inlet and a bottom portion including the outlet, wherein the device is
3 adapted to allow decoupling of the top portion and the bottom portion to remove the
4 plate.

1 26. The device of claim 1, wherein the device is a single-use product that
2 is discarded after capturing viable matter.

1 27. The device of claim 1, wherein the device includes a second inlet,
2 wherein the inlets are provided at different locations in relation to the suspension
3 medium.

1 28. The device of claim 1, wherein the plate is made of at least one of
2 glass, porous glass fibers, a ceramic material, a porous polymeric material, and a
3 metal.

1 29. A collection device for use in sampling gas that contains viable matter
2 comprising:
3 a suspension medium for preserving viable matter in a living state; and
4 means for directing a flow of gas toward the suspension medium;
5 wherein the suspension medium is configured for capturing viable
6 matter included in the gas as the gas is drawn through the means for directing a flow
7 of gas.

1 30. The collection device of claim 29, wherein the means for directing a
2 flow of gas comprises an inlet.

1 31. The collection device of claim 30, wherein the inlet tapers from a top
2 of the inlet to a bottom of the inlet.

1 32. The collection device of claim 31, wherein the bottom of the inlet has a
2 rectangular shape when viewed in the axial direction.

1 33. The collection device of claim 29, wherein the suspension medium has
2 is a gel or a semisolid material.

1 34. The collection device of claim 29, wherein the suspension medium is
2 configured to preserve the viable matter without promoting further maturation of the
3 viable matter.

1 35. The collection device of claim 29, wherein the suspension medium
2 includes a humectant, an anti-bacterial agent, and a hydrocolloid.

1 36. The collection device of claim 29, wherein the suspension medium
2 comprises water and at least one of mineral oil, starch, glycerin, galatin, and
3 carageenan.

1 37. The collection device of claim 29, wherein the suspension medium
2 comprises water and at least one of gellan, glycerin, calcium chloride, a polyol,
3 honey, corn syrup, and pectin.

1 38. The collection device of claim 29, wherein the viable matter comprises
2 at least one of a bacterium and a virus.

1 39. The collection device of claim 29, wherein the viable matter comprises
2 at least one of a mold spore, anthrax, an insect, an insect part.

1 40. The collection device of claim 29, wherein the collection device is a
2 cassette having a top portion and a bottom portion and a plate provided within the
3 cassette, wherein the top portion and bottom portion may be separated to remove the
4 plate.

1 41. A plate for use in a gas-borne matter collection device comprising:
2 a substance provided on a surface of the plate for preserving viable
3 matter in a living state without generally promoting growth of the viable matter.

1 42. The plate of claim 41, wherein the substance has is relatively is a gel or
2 a semisolid material.

1 43. The plate of claim 41, wherein the substance includes a humectant, an
2 anti-bacterial agent, and a hydrocolloid.

1 44. The plate of claim 41, wherein the substance includes a hydrocolloid
2 material and at least one nutrient.

1 45. The plate of claim 41, wherein the substance comprises water and at
2 least one of mineral oil, starch, glycerin, galatin, and carageenan.

1 46. The plate of claim 41, wherein the substance comprises water and at
2 least one of gellan, glycerin, calcium chloride, a polyol, honey, corn syrup, and pectin.

1 47. The plate of claim 41, wherein the substance comprises a hydrocolloid
2 and at least one nutrient.

1 48. The plate of claim 47, wherein the hydrocolloid is selected from the
2 group consisting of algal type hydrocolloid materials, botanical type hydrocolloid
3 materials, microbial type hydrocolloid materials, animal type hydrocolloid materials,
4 and combinations thereof.

1 49. The plate of claim 47, wherein the nutrient is one of a sugar, a cell
2 culture serum, an amino acid, a blood lipid, and a protein.

1 50. The plate of claim 49, wherein the nutrient is selected from the group
2 consisting of glucose, sucrose, bovine serum, glutamic acid, albumin, hemoglobin,
3 charcoal, sodium glycerophosphate, mercaptoacetic acid, sodium chloride, potassium
4 citrate, potassium chloride, calcium chloride, magnesium chloride, monopotassium
5 phosphate, disodium phosphate, sodium thioglycollate, L-cysteine hydrochloric,
6 peptone, sodium phosphate, potassium phosphate, and combinations thereof.

1 51. The plate of claim 47, wherein the nutrient also acts as a pH buffer.

1 52. The plate of claim 47, wherein the substance further comprises at least
2 one of a humectant, water, and an anti-bacterial agent.

1 53. The plate of claim 52, wherein the humectant is selected from the
2 group consisting of mineral oil, plant oil, peanut oil, soybean oil, vegetable oil, corn
3 oil, molasses, honey, corn syrup, fruitrim, invertase, invert sugar, glycerin, polyols,
4 Triacetin, an hydrogenated glucose syrup, a polydextrose nutrient, and combinations
5 thereof.

1 54. The plate of claim 41, wherein the substance is configured to preserve
2 viable matter without promoting further maturation of the viable matter.

1 55. The plate of claim 47, wherein the viable matter comprises at least one
2 of a bacterium and a virus.

1 56. The plate of claim 47, wherein the viable matter comprises at least one
2 of a mold spore, anthrax, an insect, an insect part.

1 57. A method of collecting viable matter included in a gaseous
2 atmosphere, the method comprising:
3 directing a flow of gas toward a suspension medium, the suspension
4 material configured to maintain viable matter in a living state;
5 capturing viable matter carried in the gas in the suspension material;
6 and
7 removing the viable matter from the suspension material.

1 58. The method of claim 57, wherein the step of removing the viable
2 matter from the suspension material comprises adding at least a portion of the
3 suspension material to a liquid.

1 59. The method of claim 58, wherein the liquid is water.

1 60. The method of claim 57, wherein removing the viable matter from the
2 suspension material comprises shaking the suspension material.

1 61. The method of claim 57, further comprising providing nutrients to the
2 viable matter after the step of removing the viable matter from the suspension
3 material.

1 62. The method of claim 60, wherein the step of providing nutrients to the
2 viable matter comprises placing the viable matter in an agar medium.

1 63. The method of claim 62, wherein the suspension material includes a
2 humectant, an anti-bacterial agent, and a hydrocolloid material.

1 64. The method of claim 57, wherein the suspension material does not
2 include an amount of nutrients sufficient to allow development of the viable matter.

1 65. The method of claim 57, wherein the viable matter comprises at least
2 one of mold, fungus, and bacterium.